

## **COURSE INFORMATION AND SYLLABUS 2012**

National University of Kyiv-Mohyla Academy

### **Introduction to Conservation Science**

**Autumn – winter 2012**

#### **CONTACT INFORMATION**

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#### **COURSE DESCRIPTION**

This course is an introduction to conservation, the applied and multidisciplinary science of maintaining the earth biodiversity. The course covers: 1. foundations of conservation science, 2. the meaning and value of biodiversity, 3. the threats to biodiversity, and 4. an introduction to the methods, approaches and tools that are used to solve conservation problems.

#### **As an overview the course will explore four key questions:**

1. What is conservation science? Introduction to conservation science as a multidisciplinary discipline.
2. What is biodiversity? Definitions, levels, global patterns, and values of biodiversity.
3. Why is it under threat? The threats to biodiversity with more detailed emphasis on fragmentation, and invasive species.
4. How can it be protected and sustained? Approaches and tools to protect and restore biodiversity, such as ex-situ and in-situ conservation; establishment of new population; systematic conservation planning of protected areas; involvement of local communities, policy, and nature interpretation.

#### **AFTER THE COURSE STUDENTS SHOULD BE ABLE TO:**

1. Define and describe different levels of biodiversity.
2. Understand and explain why biodiversity is important.
3. Identify and describe each of the main threats to biodiversity and to describe the main threats to Ukrainian biodiversity.
4. Write a critical analysis of an example/case of the conservation problems that we face nowadays.
5. Use critical thinking, find necessary information and solve conservation problems.
6. Select and justify potential solutions for conservation problems.

During the course students will also develop skills useful for every conservationist and professional: design and management of a conservation project, work in a team, active and critical reading, written and oral presentations, poster development and evaluation of information.

## COURSE ASSESSMENT

Number of credits: 3.5

Activity	N of activities	Max score for one	Total
Participation in the class			20
Exercises /case studies	4	5	20
Course project (poster presentation)	1	30	30
Essay	1	15	15
Written test	1	10	15
<b>Total</b>			100

### Educational materials:

All educational material will be sent to students' emails. Materials will consist of following components: a *Synthesis* or background document of 20-40 pages ☺, including literature cited and identification of key primary references on the topic. Some Synthesis will be accompanied by scientific articles; a *Presentation*, consisting of digital slides; an *Exercises*/or a *Case Study* designed to illustrate specific issues highlighted in the Synthesis.

## STUDENT RESPONSIBILITIES

**Participation (20 points):** Will be evaluated based on the students' performance during the class. We will have practical exercises, case studies, interactive games, and discussions.

**Exercises/case studies (20 points)** We will have exercises and/or case studies. There are 4 exercises/case studies 5 points each. There are some additional practicals/exercises that are not evaluated as they are used for deeper understanding of the topic.

### Course project (30 points)

Identify real conservation problem in Ukraine that you think is in great need of conservation actions. Develop a project to solve that problem using material (methods, approaches etc) that you have learnt during the course. Justify your choice. Present it in a form of poster and make a presentation of your poster during the class.

**Essay (15 points):** Write a short conservation project based on the idea developed in your poster presentation. Use template provided in Annex 1 but also feel free to develop and expand it.

**Written test (15 points)** will include 4 theoretical questions on basic concepts learnt during the course (2.5 points each) and 1 practical question (5 points) to solve a conservation problem.

## SYLLABUS

Date/time	Activity	Topic/Reading
12 Sep 10:00-11:20 11:40-13:00	Topic 1	<p><b><u>Introduction to the course. What is biodiversity? What is conservation biology? Measuring biodiversity</u></b></p> <p><b>READING:</b>            Malcolm, I., Hunter, Jr., Gibbs, P.J. (2007) What is Biodiversity? Species Diversity, Ecosystem Diversity. Pages 22-33 in Malcolm (ed.) Conservation Biology. Blackwell Publishing, UK.</p> <p>I.J. Harrison, M. F. Laverty and E.J. Sterling. 2006. <i>What is biodiversity?</i> Synthesis, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p> <p>Malcolm, I., Hunter, Jr., Gibbs, P.J. (2007) What is Conservation Biology. Pages 14-15 in Malcolm (ed.) Conservation Biology. Blackwell Publishing, UK.</p> <p><b>Articles for discussion (during the class)</b>            Myers, N., Mittermeier, A., Mittermeier, G., Fonseca, G., Kent, J. (2000) Biodiversity hotspots for conservation priorities. <i>Nature</i> 4, 853-858.</p> <p>Olson, D. (2001) Terrestrial Ecoregions of the world: a new map of life in Earth. <i>Bioscience</i> 401, 933-938.</p> <p>ISAAC, N. J., TURVEY, S. T., COLLEN, B., WATERMAN, C. &amp; BAILLIE, J. E. (2007) Mammals on the EDGE: conservation priorities based on threat and phylogeny. <i>PloS one</i>, 2, e296.</p>
	Exercise (homework)	<p>James P. Gibbs. 2006. <i>What is Biodiversity? A Comparison of Spider Communities</i>. Exercise, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p> <p><b>(5 points)</b>  <b>Due date – 26 Sep</b></p>
19 Sep 10:00-11:20	Topic 2	<p><b><u>Why biodiversity is important?</u></b></p> <p><b>READING:</b>            Melina F. Laverty, Eleanor J. Sterling, and Elizabeth A. Johnson. 2003. <i>Why biodiversity is important?</i> Synthesis, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p>
	Exercise (during the class)	<p>James P. Gibbs. 2006. <i>Using the IUCN Red List and National Red Book to Assess Importance</i>. Exercise, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p>
19 Sep 11:40-13:00	Topic 3	<p><b><u>Topic 3 Threats to Biodiversity.</u></b></p> <p><b>READING:</b></p>

	Exercise (during the class)	<p>Melina F. Lavery and Eleanor J. Sterling. 2004. <i>Overview of Threats to Biodiversity</i>. Synthesis, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p> <p>Malcolm, I., Hunter, Jr., Gibbs, P.J. (2007) Threats to Biodiversity. Pages 114-129 in Malcolm (ed.) Conservation Biology. Blackwell Publishing, UK.</p> <p><i>Additional reading:</i> Millennium Ecosystem Assessment (2005). Ecosystems and Human Well-being: Synthesis. Island Press, Washington, DC.</p> <p>James P. Gibbs. 2011. <i>Local versus Global Perspectives</i>. Exercise, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p>
26 Sep 10:00-11:20	Topic 4	<p><b><u>Threats to Biodiversity: Ecosystem Loss and Fragmentation</u></b></p> <p><b>READING:</b> Melina F. Lavery and James P. Gibbs. 2006. <i>Ecosystem Loss and Fragmentation</i>. Synthesis, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p> <p>Malcolm, I., Hunter, Jr., Gibbs, P.J. (2007) Ecosystem Loss and Degradation. Pages 150-183 in Malcolm (ed.) Conservation Biology. Blackwell Publishing, UK.</p>
	Exercise (In the class and as a homework)	<p>John C. Withey, Christina M. Kennedy. 2012. <i>Does the Matrix Matter? Testing the Influence of Matrix Type on Bird Responses to Forest Fragmentation</i>. Department of Biological Sciences, Florida International University.</p> <p>Copyright held by the National Center for Case Study Teaching in Science, University at Buffalo, State University of New York.</p> <p><b>(5 points)</b> <b>Due date - 3 Oct</b></p>
26 Sep 11:40-13:00	Topic 5	<p><b><u>Threats to Biodiversity: Invasive Species</u></b></p> <p><b>READING:</b> C. Finlayson and A. Alyokhin. 2006. <i>Invasive Species and Mechanisms of Invasions</i>. Synthesis, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p>
	Exercise (paper discussion during the class)	<p>Frank Courchamp, Jean-Louis Chapius, and Michel Pascal. 2003. Mammal invaders on islands: impact, control and control impact, Biological review. 78, pp. 347–383.</p>
03 Oct 10:00-11:20	Topic 6	<p><b><u>Species Extinction. Endangered Species Management.</u></b></p> <p><b>READING:</b> Malcolm, I., Hunter, Jr., Gibbs, P.J. (2007) Extinction Process. Pages 130-149 in Malcolm (ed.) Conservation Biology. Blackwell Publishing,</p>

		<p>UK.</p> <p>Conor P. McGowan, Dylan C. Kesler, and Mark R. Ryan, 2010. <i>Endangered Species Management</i>. Synthesis, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p> <p><i>Additional reading:</i></p> <p>Georgina M. Mace, Nigel J. Collar, Kevin J. Gaston et al. 2008 Quantification of Extinction Risk: IUCN's System for Classifying Threatened Species. <i>Conservation Biology</i>, Volume 22, No. 6, 1424–1442.</p> <p>Jon Paul Rodriguez et al. 2010. Establishing IUCN Red List Criteria for Threatened Ecosystems, <i>Conservation Biology</i>, Society for Conservation Biology. Volume 25, No. 1, 21–29.</p>
	Exercise (homework)	<p>Grace A. Wang (1999) <i>The Bear Facts: Grizzly Recovery in the Bitterroot Ecosystem</i>. School of Forest Resources, The Pennsylvania State University.</p> <p>Copyright held by the National Center for Case Study Teaching in Science, University at Buffalo, State University of New York.</p> <p><b>(5 points)</b></p> <p><b>Due date -10 Oct</b></p>
11:40-13:00	Topic 7	<p><b><u>Priority Setting in Conservation</u></b></p> <p><b>READING:</b></p> <p>Mace, G. M., H. P. Possingham, and N. Leader-Williams. 2006. Prioritizing choices in conservation. Pages 17-34 in D. W. Macdonald, and K. Service, editors. <i>Key Topics in Conservation Biology</i>. Blackwell Publishing, Oxford.</p> <p>Brooks, T.M., Mittermeier, R.A., Fonseca, G.A., Gerlach, J., Hoffmann, F., Lamoreux, J.F., Mittermeier, C.G., Pilgrim, J.D., Rodrigues, A.S.L. (2006), Global biodiversity conservation priorities. <i>Science</i> 313, 57-61.</p>
10 Oct 10:00-11:20	Topic 8	<p><b><u>Conservation Policy</u></b></p> <p>Invited speaker from Ministry of Ecology and Natural Resources</p>
10 Oct 11:40-13:00		Movie: Green Fire
17 Oct 11:40-13:00	Topic 8	<p><b><u>Business and Biodiversity</u></b></p> <p><b>READING:</b></p> <p><a href="http://www.teebweb.org/">http://www.teebweb.org/</a></p> <p>TEEB for different target groups</p>
31 Oct 11:40-13:00	Topic 9	<p><b><u>Protected Areas: Reserve Planning and Design.</u></b></p> <p><b>READING:</b></p>

	Exercise (during the class)	<p>Eugenia Naro-Maciel, Eleanor J. Sterling, and Madhu Rao. 2007. <i>Protected Areas and Biodiversity Conservation I: Reserve Planning and Design</i>. Synthesis, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p> <p>Margules, C. R. &amp; Pressey, R. L. (2000) Systematic conservation planning. <i>Nature</i>, 405, 243-53.</p> <p>Reserve Design Simulation Game:  <a href="http://www.uq.edu.au/marxan/resgame/index.html">http://www.uq.edu.au/marxan/resgame/index.html</a>  (not evaluated)</p>
7 Nov 11:40-13:00	Topic 10	<p><b><u>Protected Areas: Management and Effectiveness.</u></b></p> <p><b>READING</b></p> <p>Madhu Rao, Eugenia Naro-Maciel, and Eleanor J. Sterling. 2009 <i>Protected Areas and Biodiversity Conservation II: Management and Effectiveness</i>. Synthesis, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p>
14 Nov 11:40-13:00	<p>Topic 11</p> <p>Exercise (homework)</p>	<p><b><u>Conservation and Development</u></b></p> <p><b>READING</b></p> <p>Madhu Rao. <i>Biodiversity Conservation and Integrated Conservation and Development Projects</i> (ICDPs). Synthesis, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p> <p>Madhu Rao. <i>Biodiversity Conservation and Integrated Conservation and Development Projects</i>. 2006. Exercise, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p> <p><b>5 points</b></p> <p><b>Due date – 14 Nov</b></p>
21 Nov 11:40-13:00	Topic 12	<p><b><u>Nature interpretation</u></b></p> <p><b>READING</b></p> <p>D. Andrew Saunders and Margret C. Domroese. 2010. <i>Fundamentals of Nature Interpretation</i>. Synthesis, Network for Conservation Educators and Practitioners, American Museum of Natural History.</p>
28 Nov		Preparation for poster presentation and essay writing
05 Dec 11:40-13:00	Course Project poster presentations	See explanations in the syllabus
Deadline 19 Dec	Essays hand-in	See explanations in the syllabus and Annex 1 for details

## ANNEX 1

<b>Project name</b>	
<b>Project background, problem statement</b>	
<b>Brief description</b>	
<b>Location/region</b>	
<b>Purpose</b>	
<b>Aims of the project, activities and timeline</b>	
<b>Relevance of the project</b>	
<b>Target group Involvement of target group (specify how the target group will be involved in the project activities and what will be its contribution)</b>	
<b>Expected contribution to nature conservation</b>	
<b>Methods/Approaches</b>	
<b>Expected results Long-term impact Short-term impact</b>	
<b>Mechanism for measuring the success of the project</b>	
<b>Project Sustainability</b>	